



# U.S. Army Medical Research and Materiel Command

The U.S. Army Medical Research and Materiel Command is the Army's medical materiel developer, with lead agency responsibility for:

- ◆ Medical research,
- ◆ Product development,
- ◆ Technology assessment and rapid prototyping,
- ◆ Medical logistics management and health facility planning, and
- ◆ Medical information management and technology.

The USAMRMC's expertise in these critical areas helps establish and maintain the capabilities required by the Army to fight and win on the battlefield.





MG Lester Martinez-Lopez, MC  
Commanding General  
U.S. Army Medical Research and Materiel Command

## A Message from Major General Lester Martinez-Lopez

Welcome to the U.S. Army Medical Research and Materiel Command (USAMRMC). We support the Army transformation by identifying, developing, procuring and sustaining the medical technologies that will best support the rapidly deployable and responsive Army of the 21<sup>st</sup> century. This complex and diverse organization has a single purpose: to sustain and improve the readiness of the armed forces of the United States. We sustain the health and fighting ability of soldiers, sailors, airmen, and Marines through our programs in medical research, medical materiel development, medical logistics and facility planning, medical information systems, and development of new technologies to improve military health care on the battlefield. The Command is engaged in a broad spectrum of activity, from basic research in the laboratory, to innovative product acquisition, to the fielding and life cycle management of medical equipment and supplies for deploying units. This brochure provides an overview of our programs. Thank you for your interest in the USAMRMC and Army medicine.

## USAMRMC's Vision...

To be the constantly relevant medical organization integrating research, acquisition, logistics, and technology that protects, projects, and sustains the warfighter today, invents global medical solutions for tomorrow, and keeps the warfighter on point for the Nation.

## USAMRMC's Mission...

- ◆ Respond to the Army/DoD requirements for science, technology, knowledge, and medical materiel;
- ◆ Manage product life cycle of medical materiel and facilities; and
- ◆ Support the power projection Army with medical materiel (right place, right time, right amount).



## USAMRMC's Goals...

Goal 1. Be the warfighter's choice for medical research, technology, acquisition, and logistics, fulfilling Defense needs.

Goal 2. Ensure that our organizations and business practices are flexible, dynamic, and agile in order to respond to and shape national and worldwide medical requirements in support of traditional and non-traditional Defense mission areas.

Goal 3. Keep our people competent and relevant. Gain a competitive edge in our unique core capabilities in support of evolving Defense health needs and missions through empowerment of individuals and collective excellence.





# U.S. Army Medical Command

## U.S. Army Medical Research and Materiel Command

### U.S. Army Aeromedical Research Laboratory

U.S. Army Institute of Surgical Research

U.S. Army Medical Research Institute of  
Chemical Defense

U.S. Army Medical Research Institute of  
Infectious Diseases

U.S. Army Research Institute of  
Environmental Medicine

Walter Reed Army Institute of Research

### Telemedicine and Advanced Technology Research Center

U.S. Army Health Facility Planning Agency

U.S. Army Medical Information Systems  
and Services Agency

U.S. Army Medical Materiel Agency

U.S. Army Medical Materiel Center-Europe

U.S. Army Medical Materiel  
Development Activity

U.S. Army Medical Research Acquisition Activity

*Medical Research  
and Development*

*Congressional  
Special Interest  
Research*

*Telemedicine and  
Advanced Medical  
Technologies*

*Medical  
Logistics and  
Facilities*

*Information  
Management/  
Information  
Technology*

*Acquisition  
and  
Contracting*

**Protect  
Project  
Sustain**

The USAMRMC operates six medical research laboratories and institutes in the United States. These laboratories make up the core science and technology (S&T) capability of the Command. They are centers of excellence in specific areas of biomedical research, staffed by highly qualified military and civilian scientists and support personnel. The Command's in-house S&T capabilities are enhanced by a large extramural contract research program, and numerous cooperative research and development (R&D) agreements with leading R&D organizations in the civilian sector.

The Command also operates seven units exclusively focused on medical materiel development, contracting, medical logistics management, health facility planning, and information management and technology.

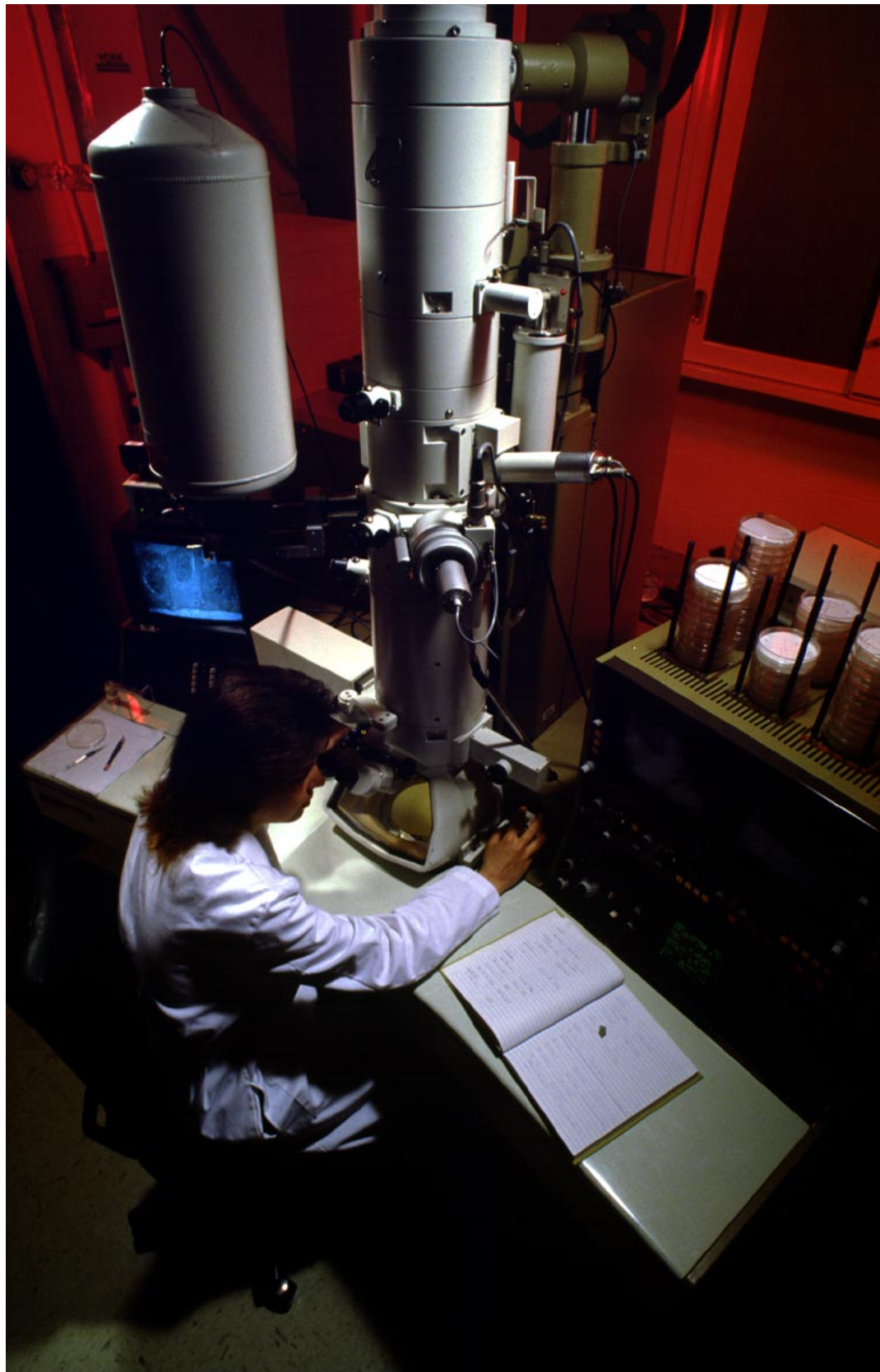
Approximately 4,600 military, civilian and contractor personnel are assigned to or support the headquarters and 12 subordinate units. Officers, enlisted soldiers, and civilians provide a wide variety of medical, scientific, and technical expertise. Many of these personnel are among the most respected and knowledgeable specialists in their fields.

The USAMRMC's motto, "Protect, Project, Sustain," emphasizes the Command's priorities in support of the warfighter. Medical information and products made available by the USAMRMC will protect the health and safety of the force and sustain it through deployment and combat.



# Medical Research and Development

- ◆ Military Infectious Diseases
- ◆ Combat Casualty Care
- ◆ Military Operational Medicine
- ◆ Medical Chemical Defense
- ◆ Medical Biological Defense
- ◆ Congressional Special Interest Medical Research





# Military Infectious Diseases Research

Infectious diseases are a major threat to operational readiness of U.S. military forces. The Military Infectious Diseases Research Program focuses on prevention, diagnosis, and treatment of diseases that can seriously hamper military mobilization, deployment, and effectiveness. Research emphasis includes the following:

- ◆ Development of vaccines against militarily important diseases,
- ◆ Discovery and development of prophylactic and treatment drugs for infectious diseases,
- ◆ Techniques for rapid identification of disease organisms and diagnosis of infections,
- ◆ Collection and analysis of epidemiological data that aid in control of relevant infectious diseases, and
- ◆ Studies of control measures against vectors of relevant infectious disease.

In Vietnam, two-thirds of all hospital admissions were due to infectious diseases, including malaria, dengue, scrub typhus, and Japanese encephalitis.

Dengue and malaria caused hospitalizations in Somalia, and dengue affected troops in Haiti. Additional threats to soldiers include diarrhea, hepatitis, hantavirus infections, leishmaniasis, meningococcal disease, HIV, and infection by sundry exotic lethal and/or hemorrhagic fever viruses. Threats vary depending on the environment in which soldiers are deployed.

This prolific research program has produced licensed vaccines for hepatitis A, Japanese encephalitis, typhoid, adenovirus, and meningococcal meningitis. Licensed drugs include mefloquine, doxycycline, and malarone for prevention of malaria, and halofantrine for treatment of malaria. The current dosing regimen for and definitive quantitation of the toxicity of pentostam for treatment of cutaneous leishmaniasis was developed in this program. Finally, the program has developed innovative new products for protection from disease-spreading insects.



*The primary goal of the Military Infectious Diseases Research Program is to sustain the health of the warfighter against infectious disease threats.*

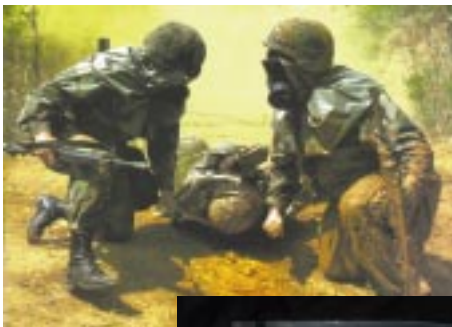


*To minimize the risk of infectious diseases to military personnel, the USAMRMC has a comprehensive research program on disease surveillance, diagnosis, treatment, and prevention. This allows early recognition and response to both familiar diseases, like malaria, and newly emerging diseases, like hantavirus-induced hemorrhagic fever with renal syndrome, wherever they occur.*

# Combat Casualty Care Research

The Combat Casualty Care Research Program emphasizes delivery of immediate, far-forward, and en-route care for soldiers sustaining life-threatening injuries on the battlefield. Research efforts address:

- ◆ Products and methods that will reduce the number of battlefield deaths due to hemorrhage;
- ◆ Advanced, noninvasive physiologic sensors for detecting penetrating or blunt trauma wounding events and remote triage;
- ◆ Techniques or technologies to improve the acquisition and availability of blood products and reduce the medical and logistical requirements to care for battlefield casualties;
- ◆ Prevention and treatment of dental disease and treatment of battlefield oral and maxillofacial injuries;



*Since mid-WWII, nearly 50% of combat deaths have been due to exsanguinating hemorrhage. Of those, about half could have been saved if timely, appropriate care had been available.*



*Because approximately 86% of all battlefield deaths occur within the first 30 minutes after wounding, the abilities to rapidly locate, diagnose, and render appropriate initial treatments are vital to reversing the historical outcomes of battlefield injuries.*

- ◆ Surgical techniques, equipment, and implants to address extremity/musculoskeletal injuries sustained on the modern battlefield;
- ◆ Neuroprotective treatment strategies for brain and spinal cord injuries, which significantly improve the prognosis for functional recovery of the soldier;
- ◆ Diagnostics to help the medic on the battlefield to determine which casualties require immediate resuscitation; and
- ◆ The best fluids and strategies for resuscitation to improve survival when evacuation is delayed and resources are limited.

Military casualties may wait for hours before definitive health care can be provided; initial treatment and subsequent evacuation occur in austere environments characterized by limited supplies and limited diagnostic and life-support equipment; and provision of acute and critical care is labor intensive and must frequently be provided by non-physician medical personnel. Thus, the primary challenge for combat casualty care research is to overcome these limitations by providing biologics, pharmaceuticals, and devices that enhance the capability of first responders to effectively treat casualties as close to the geographic location and time of injury as possible.



*The all-electric field dental set provides treatment capability equal to or greater than the present capability with reduced equipment cost. Also, by eliminating the need for a 5 kilowatt generator, each Dental Support Unit will be 24 tons lighter and 18 vehicles (trailers) smaller.*



# Military Operational Medicine Research

The USAMRMC Military Operational Medicine Research Program has three medical research thrust areas aimed at providing timely and realistic biomedical solutions that protect, sustain, and enhance soldier performance and health across the continuum of military operations and training. The three thrust areas are neuropsychology and performance, injury science and systems hazards research, and metabolism and bioenergetics. Within these thrust areas, basic and applied medical research is conducted to develop a fit and ready force. Basic research anticipates the needs of the warfighter in future operations. Applied research provides biomedical solutions to meet the immediate needs of the warfighter. Additionally, congressionally directed projects fill urgent military medical research needs and have augmented research programs in areas such as deployment health, neurotoxin exposure protection, bone physiology, neurobiology of stress, and health hazard assessment methods.



## Neuropsychology and Performance

**Principal Laboratory:**  
**Walter Reed Army Institute of Research**

Symptomatic of the increase in deployments of the Army as a whole, the number of deployments conducted by U.S. Army Europe/Seventh Army has increased by six times the deployments during the Cold War while the number of personnel has decreased by 70%. This increase in operations tempo (OPTEMPO) and personnel tempo (PERSTEMPO) impacts the success of military missions. Soldier decisionmaking, resilience, and performance are studied to effectively manage the effects of OPTEMPO and PERSTEMPO on soldier and unit performance. Pharmacological, training, and nutritional strategies are studied as interventions to optimize performance, such as mitigating the effects of sleep deprivation in sustained operations.



## Injury Science and Systems Hazards Research

**Principal Laboratory:**  
**U.S. Army Aeromedical Research Laboratory**

During training and deployment, soldiers are at risk for injury, incapacitation, and degraded performance resulting from inhaled toxic gases, blunt trauma, whole body blast effects, directed energy, stress fracture, vehicle jolt, and load carriage effects. The study of each of these effects is leading to the development of an integrated biomechanical model of injury and fatigue. Presently, articulated models of the head and neck are being developed to define the manner and amount of head-supported mass that soldiers can



sustain without risk of injury or performance deficits due to muscle fatigue. These models are critical, particularly for Army aviators, for the exploitation of helmet-mounted display technology and head and eye protection devices. In addition to physical hazards, there are significant risks for psychological hazards. Critical to Army aviators is spatial disorientation (SD) -- the misperception of aircraft position, motion, and altitude. During Operation Desert Shield/Storm, 81% of Army aviation nighttime accidents were ascribed to SD. USAMRMC, through the Joint Technology Coordinating Group 5, is leading a tri-service and allied effort to capture research results useful in training pilots to identify conditions that lead to SD so that they can learn to avoid or recover from these events.

*Army aviators and ground vehicle crews rely on helmet-mounted displays. These displays change the center of gravity normal to the head and neck and increase the amount of mass typically supported by the neck. Articulated models of the head and neck define the manner and amount of head-supported mass that can be sustained by a soldier.*

*Physiological status monitoring is being developed as a real-time gauge of soldier and unit physiological readiness. The information will be used to inform Command decisions on unit performance and provide remote medical assessment of combat casualties.*





*The adverse effects of repeated jolt in military vehicles and aircraft will be significantly reduced as biomedical models of injury and fatigue transition from the laboratory to the operational environment through improved equipment design and the development of active restraints.*



*Women, and to a lesser extent men, suffer high rates of stress fracture during initial military training. A significant research effort to protect and enhance bone health is targeting the elimination of training-related stress fractures.*

## Metabolism and Bioenergetics

**Principal Laboratory:**  
**U.S. Army Research Institute  
of Environmental Medicine**

Understanding the limits of human health and performance in military operational extremes is quintessential to projecting, protecting, and sustaining the force as it is projected into varied operational environments. The body supplies energy for vital functions during sustained operation in extreme environments by reducing other metabolic demands and increasing breakdown of tissue. Dramatic responses of the hormones that regulate metabolic systems help retain salt and water, maintain blood sugar levels, and maintain strength endurance. Fitness and training regimes and nutritional supplements are studied to optimize metabolic adaptation to the high energy demands of combat.

In extreme cold environments, tyrosine promises to be a viable nutritional supplement for maintaining marksmanship. In extreme heat, methods of increasing skin blood flow are explored to improve microclimate regulation of core body temperature. Acute Mountain Sickness (AMS) can develop into potentially fatal pulmonary or cerebral edema in approximately 18% of soldiers at 2,000m and in approximately 70% of soldiers at 4,300m with rapid ascent from sea level. A number of acclimatization strategies and pharmacological supplements are being explored to reduce AMS casualties during force projection to mountainous regions. Toxic industrial and agricultural chemicals, radiofrequency radiation, and other operational exposures are being studied to protect soldiers against long-term health consequences.



*Research to extend the capacity of soldiers in extreme environments is currently focused on hydration status and regulation of core body temperature. Hypothermia is an important operational threat in cold environments but even heat exhaustion can occur with intense workloads and multiple layers of insulation.*



*At least a dozen major field studies provided the biomedical data for procurement of new carbohydrate supplements to enhance cognitive and physical performance in operational environments.*



# Medical Chemical Defense Research



*The M291 Skin Decontamination Kit provides the soldier with a safe and effective means to decontaminate exposed skin areas.*



The mission of the Medical Chemical Defense Research Program (MCDRP) is to preserve combat effectiveness by timely provision of medical countermeasures in response to Joint Service Chemical Warfare (CW) Defense Requirements.

Nerve agents can be fatal to the unprotected warfighter. Survivors may have recurring seizures and long-term brain damage. Through Joint research and development, the nerve agent threat has been substantially reduced by the fielding of numerous products:

- ◆ Pyridostigmine, a pretreatment drug, can be administered orally to troops under risk of CW attack without degrading their performance.
- ◆ The Mark I Nerve Agent Antidote Kit provides the soldier with the nerve agent antidote atropine/2-PAM.
- ◆ The Convulsant Antidote for Nerve Agent—diazepam in an autoinjector—is used as an adjunct therapy for nerve agent poisoning to protect against seizure-induced brain injury and to enhance survival.
- ◆ Aerosolized atropine can be rapidly administered far-forward to casualties for the control of respiratory effects of nerve agents.
- ◆ Skin Exposure Reduction Paste against Chemical Warfare Agents forms a film barrier on skin and augments Mission-Oriented Protective Posture (MOPP) gear by preventing or delaying the penetration of a wide variety of CW agents including the blistering agent sulfur mustard.

The Performance Assessment Battery, a microcomputer-based software product, provides a standardized means of estimating the effects of drugs and other environmental stressors on human performance under operational conditions.

Research and product development supporting pretreatment, treatment, diagnostics, and clinical management of the chemical casualty are the keys to continuing discovery and fielding of medical countermeasures to CW agents. Successful ongoing acquisition development programs include: active Topical Skin Protectant research; Advanced Anticonvulsant research; a therapy for sulfur mustard exposure; effects of exposure to low level CW agents; and comparison of novel threats to classical CW agents and the effectiveness of existing countermeasures.

The MCDRP also provides education and training to officers and enlisted persons from all Services who will be the doctors, nurses, and medics that will treat the warfighter exposed to CW agents. In addition, this information is broadcast several times a year via satellite to first responders who would likely be tending to casualties exposed to CW agents in the event of a terrorist action.



*Staff from the U.S. Army Medical Research Institute of Chemical Defense (USAMRICD) and the U.S. Army Medical Research Institute of Infectious Diseases (USAMRIID) present an intensive 7-day course to train military health care providers in the diagnosis and treatment of chemical and biological casualties.*

# Medical Biological Defense Research



*Researcher decontaminating positive pressure protective suit worn in maximum containment laboratory (left). Medical researchers review laboratory results (above).*

The mission of the Medical Biological Defense Research Program is to ensure the sustained effectiveness of U.S. Forces in a biological warfare (BW) environment and deter the use of these weapons by maintaining a strong medical defensive posture.

Vaccines and drugs for biological threat agents and toxins are designed to prevent casualties in the event of a BW attack. Diagnostic tests and reagents are developed to diagnose disease in the event of actual exposure to biological agents. Antitoxins and drugs are designed to treat casualties, prevent deaths, and maximize return to duty after exposure.

Medical biological products in advanced development as of FY00 include vaccines against Q-fever, tularemia, smallpox (a next-generation, cell-culture derived vaccine), Venezuelan equine encephalitis, and multivalent (A, B, C, E, and F) recombinant botulinum vaccine.

Medical biological defense concepts actively being pursued in medical biological defense research include a recombinant plague vaccine, a combined equine encephalitis (VEE/EEE/WEE) vaccine, and vaccine against ricin toxin. An effort to transition a next-generation anthrax vaccine to advanced development was re-started in FY00.

Because the most likely route of dissemination of a BW agent on the battlefield is through small-particle aerosols, researchers continue to develop, refine, and validate equipment and experimental models used to study airborne infection and prevention of disease. If exposure and illness do occur, rapid diagnosis is essential for proper treatment and medical management. Field-deployable, rapid assays are being developed for diagnosis of BW agent exposure.

In addition to R&D, training military and civilian health care professionals in the diagnosis and treatment of BW agent exposure is a Command priority. USAMRMC experts also provide technical support to law enforcement agencies and counterterrorism initiatives.



*Traditional on-site training pertaining to the medical management of CW/BW casualties is supplemented by the use of state-of-the-art distance learning technologies to greatly expand course availability. Viewing audiences include international and U.S. military personnel as well as domestic first responders.*





## Biological Arms Control Treaty Office

The U.S. Army Biological Arms Control Treaty Office (BACTO) was established within the USAMRMC in response to a need for central management of biological arms control efforts and to ensure continuity of support within the Army for all biological arms control negotiations and implementation activities.

The mission of this office is twofold. As a focal point, the BACTO provides Headquarters, Department of the Army, the Joint Staff, and the Office of the Secretary of Defense (OSD) with technical support for negotiations, compliance, and implementation of the 1972 Biological and Toxin Weapons Convention (BWC). The BACTO also facilitates and ensures Army-wide implementation and compliance with all biological arms control agreements to which the U.S. Government is a signatory.



In executing these missions, the BACTO performs the following functions:

- ◆ Provides technical guidance for U.S. negotiations in support of the BWC,
- ◆ Coordinates throughout the Army for visits and/or inspections pursuant to the provisions of biological arms control agreements,
- ◆ Prepares Army sites for the conduct of biological arms control visits and/or inspections,
- ◆ Provides biological sample collection and analysis on a DoD-wide basis,
- ◆ Compiles Army data generated for annual declarations to the United Nations on biological defense activities,
- ◆ Coordinates with major commands to ensure uniform implementation of biological arms control support activities, and
- ◆ Supports OSD's efforts in cooperative threat reduction related to biological weapons.



# Congressional Special Interest Medical Research

The USAMRMC has been entrusted by Congress to manage special research programs. The funds for the Congressional Special Interest Medical Research Programs (CSI) are not in the President's Budget; they are added to the DoD Budget by Congress. Since 1990, the USAMRMC has managed over 100 CSI programs totaling almost \$2.5 billion. The USAMRMC's vision for CSI programs is to ensure the sponsorship of good science, as requested by Congress, that can benefit the DoD and the civilian sector. CSI programs directly relevant to existing DoD or Army R&D programs are managed by the USAMRMC Research Area Directorates (RADs). CSI programs involving advanced technology are managed by the Telemedicine and Advanced Technology Research Center (TATRC). The remaining programs are managed by the office of the Congressionally Directed Medical Research Programs (CDMRP). Following are examples of CSI programs.

## Research Area Directorates

### ***Military Infectious Diseases: Military Human Immunodeficiency Virus (HIV) Research***

The goals of this program are to develop vaccines to prevent HIV infection, educate troops, develop a forward diagnostic test, and deploy post-exposure prophylaxis to medical personnel in high risk zones. The congressional funds supplement core program funds.

### ***Combat Casualty Care: Battlefield Surgical Tissue Replacement and Repair***

This program will develop a multi-functional integument and repair material using an elastin biomaterial deployed via dye-targeted laser fusion that will provide a new and important adjunct to the early and aggressive treatment of hemorrhage, organ rupture, organ fracture, and hollow organ damage for use on the battlefield by both medics and surgeons.

### ***Military Operational Medicine: Neurotoxin Exposure Treatment Program (NETRP); Osteoporosis and Bone Health Research Program***

The NETRP grants advance understanding of environmental and military operational factors potentially involved in neurodegenerative diseases, with particular emphasis on Parkinson's disease; this program also explores mechanisms of injury and identifies potential neuroprotectants and other preventive and treatment strategies. Grants advance the field of bone research with exploration of regulatory mechanisms involved in normal bone remodeling stimulated by biomechanical forces; this program will lead to strategies to prevent stress fractures and also optimize bone health to prevent later problems of osteoporosis.

### ***Medical Chemical and Biological Defense: Epidermolysis Bullosa***

This program will identify common molecular blistering mechanisms between epidermolysis bullosa and sulfur mustard-induced blistering and develop potential therapeutics to accelerate wound healing.

## Telemedicine and Advanced Technology Research Center

### ***Disaster Relief and Emergency Medical Services (DREAMS)***

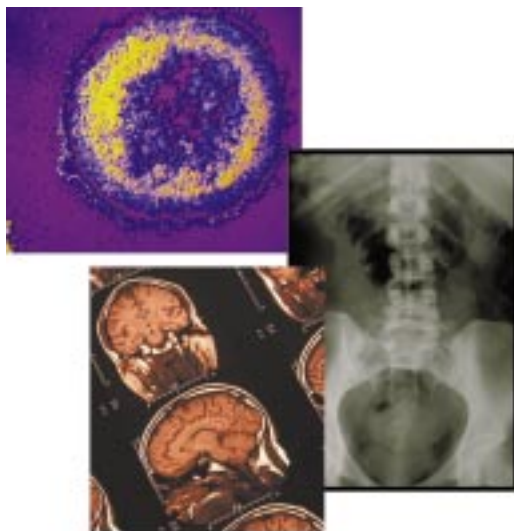
This program has three components. The emergency medical services component will test interactive telemedicine technologies to treat patients in both urban and rural settings. The CW/BW component will develop chemical sensors for on-site diagnosis of toxic substances and biological decontamination of CW agents. The diagnostic methods and therapies component will treat patients who are unable to receive advanced care quickly, and develop mechanisms to extend life beyond the "golden hour."

### ***National Medical Testbed***

The goal of this program is to apply defense and aerospace technology to advanced health care delivery. It will support studies that will improve and evaluate the delivery of health care to underserved populations, including the civilian population in general, and far-forward deployed active duty service members.

### ***Center for Innovative Minimally Invasive Therapy (CIMIT)***

This project combines the clinical and technical expertise of a consortium of non-profit institutions. The primary aim is to develop technologies that push the capability of modern medicine to diagnose and treat patients using minimally invasive approaches by concentrating on five key Clinical Focus Areas: cardiovascular disease, cancer, stroke, trauma and critical care, and new initiatives.







## Congressionally Directed Medical Research Programs

The USAMRMC's CDMRP manages extramural grant programs for research specified by Congress, including programs for breast, prostate, and ovarian cancer; and neurofibromatosis. In pursuit of the objectives to reduce the incidence of disease, improve survival, and enhance the quality of life for those affected by disease, the USAMRMC's goals are to foster new research directions, address neglected issues, and attract new investigators to the field.

Grant programs are managed as unique public/private partnerships among the military, scientists, consumers, and policymakers. Based on guidance from the National Academy of Sciences Institute of Medicine, a competitive two-tiered review process was implemented: a scientific merit review in the first tier and a programmatic review in the second. Since 1992, the CDMRP has administered over \$1.5B in congressional appropriations, processed over 18,000 proposals, and provided over 2,750 grants to institutions in the U.S. and abroad.

### **The CDMRP....**

- Targets specific research areas each year as directed by Congress
- Encourages consumer participation on panels
- Adapts a science management model to accommodate rapid change
- Uses two tiers of formal proposal reviews
- Funds research areas not addressed by other mechanisms
- Funds high-risk/high-gain proposals
- Encourages innovative approaches
- Encourages participation of new researchers as well as established investigators
- Supports the minority health initiative
- Engages in collaborative efforts with the National Cancer Institute and other funding agencies



### **Breast Cancer Research Program (BCRP)**

The BCRP has awarded over 2,700 research grants representing over \$1B in congressional appropriations since FY92. Collectively, a broad-based, diverse research portfolio has been funded encompassing all research disciplines relevant to breast cancer. The BCRP aims to complement other existing federal programs by investing in innovative, translational, and training research projects.

### **Prostate Cancer Research Program (PCRP)**

In FY97-00, Congress appropriated \$210M for the PCRP. These funds will support over 425 grants and contracts. Proposals were solicited to support innovative research projects from new investigators entering the prostate cancer research field, and innovative projects from established investigators.

### **Ovarian Cancer Research Program (OCRP)**

Congress provided \$39.5M in FY97-00 for the OCRP. Awards support the development of new strategies and novel applications of existing technologies to prevent ovarian cancer.



### **Neurofibromatosis Research Program (NFRP)**

Congress appropriated \$52.3M in FY96-00 for the NFRP. To date, the program has sponsored 46 grants focusing on the basic genetics and pathogenesis of neurofibromatosis. The FY97 program supported two natural history studies of tumor growth in both forms of the disease (NF1 and NF2) that can readily be translated into clinical trials. The remainder of the awards have been investigator-initiated awards with or without postdoctoral fellowships, idea awards, and new investigator awards.

### **Peer Reviewed Medical Research Program (PRMRP)**

The PRMRP provides medical research that is pertinent to the welfare of the military forces. The program was established with congressional appropriations of \$19.5M in FY99 and \$25M in FY00. Through tri-service and interagency coordination, these funds focus on issues of military health. The Army is the Executive Agent for this program and the CDMRP is the program manager. The Armed Services Biomedical Research Evaluation and Management Committee provides recommendations for use of these funds.





# Telemedicine and Advanced Medical Technologies

*Telemedicine reflects the convergence of technological advances in a number of fields, including telecommunications, space science (e.g., satellites), materiel sciences, robotics, computer and software engineering, artificial intelligence, perceptual psychology, and medicine.*

- ◆ Clinical Applications
- ◆ Information Science
- ◆ Telemedicine Operational Engineering
- ◆ Program Integration and Planning

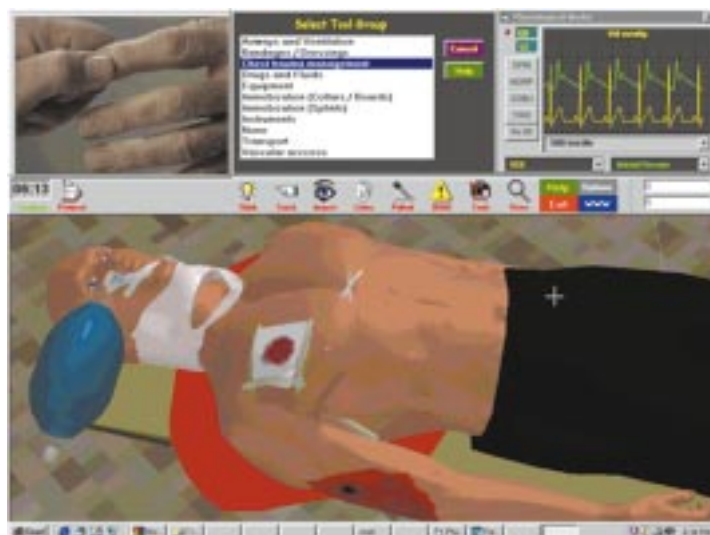






The Telemedicine and Advanced Technology Research Center (TATRC), a subordinate element of the USAMRMC, is charged with managing congressionally mandated advanced technology projects in telemedicine and advanced medical technologies. The TATRC maintains a productive mix of partnerships with federal, academic, and commercial organizations. Additionally, the TATRC provides short duration, technical support (as directed) to domestic, federal, and Defense agencies; develops, evaluates, and demonstrates new technologies and concepts; and conducts market surveillance with a focus on leveraging emerging technologies in health care and health care support. Ultimately, by leveraging its partnerships, TATRC's activities will help make medical care and services more accessible to soldiers, reduce costs, and enhance the overall quality of health care in war- and peacetime.

The USAMRMC's telemedicine program, executed by the TATRC, applies physiological and medical knowledge, advanced diagnostics, simulations, and effector systems integrated with information and telecommunications for the broad purpose of enabling medical assets to operate at a velocity that supports the Objective Force. The program scope is to leverage, adapt, and integrate medical and commercial/military nonmedical technologies to provide logistics/patient management, training devices or systems, collaborative mission planning tools, differential diagnosis, consultation, and knowledge sharing.

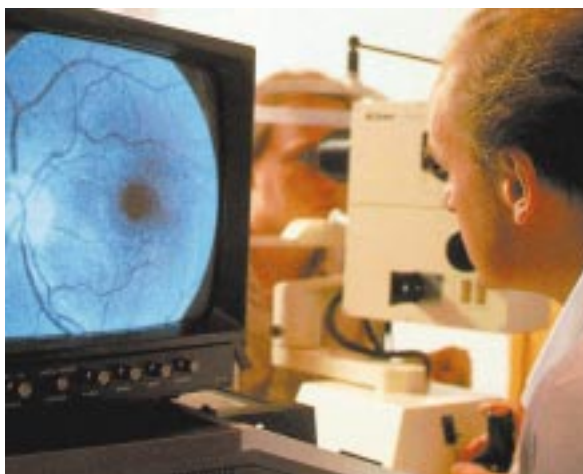


These capabilities will effectively facilitate field medical support by improving planning and enabling real-time what-if analysis, among other benefits. Specifically, products of this program will:

- ◆ Reduce the medical footprint and increase medical mobility while ensuring access to essential medical expertise and support,
- ◆ Incorporate health awareness into battlespace awareness,
- ◆ Improve the skills of medical personnel and units, and
- ◆ Improve quality of medical/surgical care throughout the battlespace.

## Clinical Applications Division (CAD)

The Clinical Applications Division (CAD) integrates advanced medical technology with innovative clinical business practice solutions to improve access to quality medical care. The CAD monitors private and federal technology sectors to identify emerging advanced medical technologies for direct clinical business applications. The CAD's access to practicing health care providers, soldiers and patients, and early input (as clinical end users) into the design of products during the R&D process allows for testing and evaluating the telemedicine technologies and associated clinical practices in federal and civilian clinical environments.





## Information Science Division (ISD)

The Information Science Division investigates, evaluates, develops, and implements advanced internet solutions to support the application of telemedicine and medical/office technologies, medical informatic devices/programs that capture, transmit, and analyze patient information, and other tools that enhance decision-making processes such as models, artificial intelligence, workflow, wireless information access, intelligent agents, and knowledge management.



## Telemedicine Operational Engineering Division (TOED)

The Telemedicine Operational Engineering Division researches and prototypes telemedicine systems utilizing current and emerging commercial and government off-the-shelf technologies to enhance tri-service medical care, medical command and control, and situational awareness. The TOED provides short duration, medical augmentation to regional domestic, federal, and Defense agencies responding to disaster, civil-military cooperative action, and humanitarian and emergency incidents. Additionally, the TOED provides various support services to include technical support, engineering support, and telemedicine training, and facilitates the prototyping, integration, and testing laboratory (PITLAB) to provide a simulated field hospital environment for testing and evaluating technologies.



## Program Integration and Planning (PIP) Division

The Program Integration and Planning Division implements strategic planning and manages a wide variety of congressionally mandated programs, and leverages over 20 Congressional Special Interest Research Programs to achieve the DoD Science and Technology Objectives.



*The latest in Personal Information Carrier (PIC) technology — PICs allow data capture and delivery of information including x-rays, MRIs, EKGs, or hundreds of pages of text to enable efficient information management on the battlefield. The PIC, smaller than a conventional dogtag, stores a soldier's personal medical history and can also be updated on a hand-held computer.*

*The Special Medical Augmentation Response Team (SMART) can be quickly and easily deployed to provide communications on a moment's notice.*





# Information Management & Information Technology

*"One-stop shopping"  
for the whole host of  
information management  
modernization needs from  
the purchase of personal  
computers to the design,  
development, installation,  
training, and operations of  
the most sophisticated  
and comprehensive soft-  
ware applications or  
databases.*



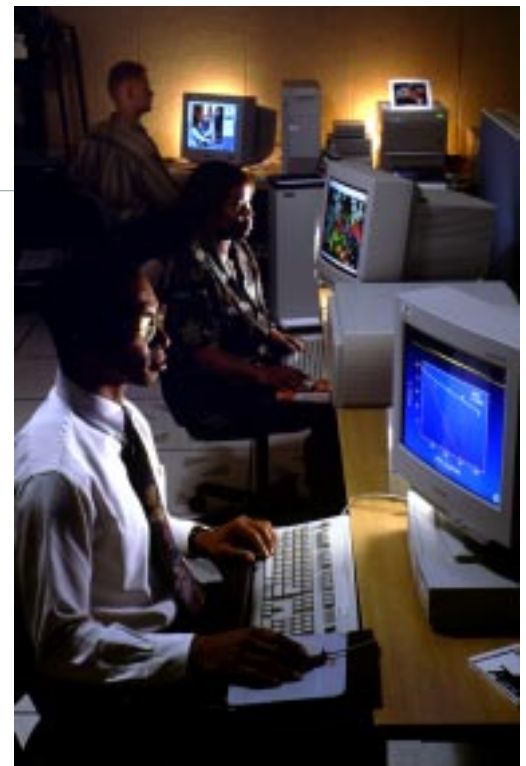


The USAMRMC is the AMEDD's Information Management/Information Technology (IM/IT) materiel developer. With the U.S. Army Medical Information Systems and Services Agency (USAMISSA) as the lead, USAMRMC offers program management support for IM/IT initiatives where those initiatives either cut across organizational boundaries, or where the life-cycle costs are projected to be significant.

The program management team in USAMISSA is a dynamic group with program managers (PMs), project directors (PDs), and engineers possessing certifications and experience in program and systems management that enables them to undertake IM/IT initiatives of wide-ranging complexities. Coupled with the U.S. Army Medical Research Acquisition Activity (USAMRAA) as the contracting agency, and the requirements

documentation role of the AMEDD Center and School, the USAMISSA is capable of working with the functional proponent from requirements conception, through system development and deployment, into sustainment, and ending with system retirement: managing the complete life-cycle support for IM/IT systems.

The USAMISSA is also the USAMRMC's organization for deploying and sustaining IM/IT systems supporting the AMEDD as well as tri-Service organizations around the world. The USAMISSA is responsible for the data transport network, bandwidth services, voice and video services, network management, VTC room deployment and certifications, Defense Messaging System (DMS), dial-in services, and computer systems security administration.

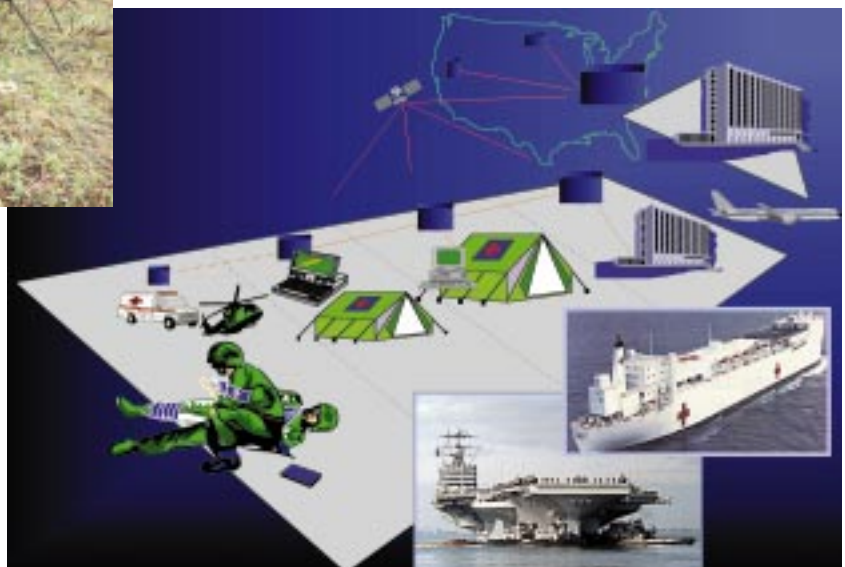


By leveraging the DoD's security organizations, the USAMISSA has minimized the effects of the recent upsurge in virus attacks, as well as protected our medical IM/IT systems using firewalls and intrusion detection systems. The Year 2000 date rollover had little effect on our legacy systems thanks to the planning and execution of the Y2K effort by the USAMISSA.

The USAMRMC is striving to become the AMEDD's IM/IT provider-of-choice. Through the efforts of its subordinate organizations, USAMISSA and TATRC, the command provides a complete life-cycle solution supporting the customer's needs.



*The IM/IT mission supports peacetime health care delivery at Army medical facilities as well as to field medical forces deployed anywhere in the world.*





# Medical Logistics and Facilities

*In peacetime and during full-spectrum military operations, USAMRMC provides leadership and executes critical materiel support missions world-wide. The USAMRMC's capstone functions are to provide direction and resources, acquire and manage assets, provide capabilities and distribute materiel, and support the power projection force. Essential to the success of the USAMRMC is the establishment of key partnerships and associations that advance professional and collective knowledge, technologies, skills, and abilities.*







The Command's major responsibilities in the dynamic and diverse medical materiel arena center on these core competencies:

- ◆ Oversee materiel acquisition and logistics functions as part of the Medical Research, Development, and Acquisition (RDA) Program;
- ◆ Execute strategic level medical logistics readiness and other critical health care programs;
- ◆ Conduct operational logistics and single integrated medical logistics management (SIMLM) in peacetime and during contingencies; and
- ◆ Promote planning, modernization, and technology improvements as part of life-cycle management for Army health facility programs.

The USAMRMC performs its critical materiel missions across these major Army processes: force management, force projection, and force sustainment.

As part of its role in force management, the Command participates in and conducts technology watch, materiel development, acquisition logistics, and materiel distribution. Fundamental to this role are the materiel assessment, procurement, fielding, and follow-on support for improved or new medical equipment, organizations, and medical facilities.

In the realm of force projection, USAMRMC centrally manages several Army and The Surgeon General readiness programs. These programs include the acquisition, storage, distribution, and transfer of prepositioned stocks located ashore and afloat, as well as medical chemical defense packages, short shelf-life pharmaceuticals, and other materiel. Integral to this support are partnerships with defense organizations and industry. The Command also supports deployable medical logistics support teams.

Within the area of force sustainment, the Command is constantly exploring and employing innovative methods to meld automated information technologies with logistics and transportation best business practices. Such focused logistics initiatives provide more efficient and accurate ways to deliver and manage precision packages and biomedical maintenance capabilities.

The U.S. Army Medical Materiel Agency (USAMMA) serves as the AMEDD's strategic level organization whose mission is to enhance medical logistics readiness throughout the full range of military health service support missions worldwide, develop and implement innovative logistics concepts and technologies, and promote medical logistics information and knowledge.



The U.S. Army Medical Materiel Center, Europe (USAMMCE) conducts operational logistics as the European SIMLM in support of the Army, Navy, and Air Force component commands. The Center also supports the Department of State embassies throughout much of the world and other U.S. forces in Europe, Africa, the Middle East, and Southwest Asia. Due to the Center's integrated medical logistics capabilities, USAMMCE works in partnership with USAMMA in managing many of the strategic level programs.

The U.S. Army Health Facility Planning Agency (USAHFPA) consists of deployable experts in planning, programming, design, construction, transition, and sustainment of facilities. The USAHFPA provides assistance in assessing and refining facility requirements of the AMEDD and other customers and then executing design and construction investments whenever and wherever needed. The Agency also deploys special response teams during operations other than war, disaster relief, peacekeeping efforts, and nation building.

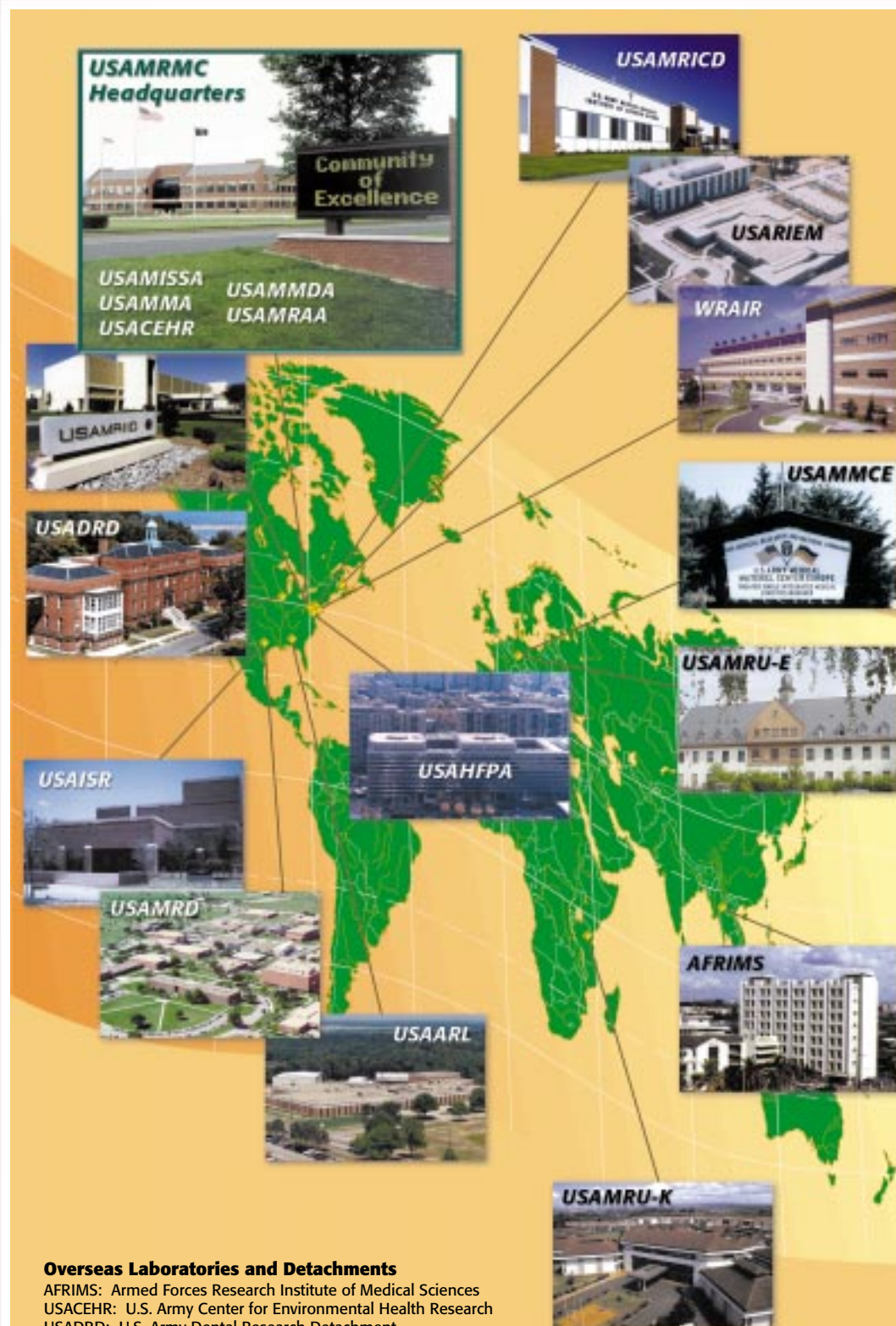
*Major General John S. Parker, Commanding General, USAMRMC, and U.S. Senator Paul Sarbanes of Maryland cut the ribbon at the dedication ceremony of the new Walter Reed Army Institute of Research—Naval Medical Research Center facility on October 5, 1999.*





# USAMRMC Organizations

*Located throughout the United States and overseas, the USAMRMC consists of the Headquarters, six research laboratories or institutes, plus six management organizations. In addition, the WRAIR manages two separate detachments and three overseas laboratories. A third detachment is overseen by the USARIEM.*



## Overseas Laboratories and Detachments

AFRIMS: Armed Forces Research Institute of Medical Sciences  
 USACEHR: U.S. Army Center for Environmental Health Research  
 USADRD: U.S. Army Dental Research Detachment  
 USAMRD: U.S. Army Medical Research Detachment  
 USAMRU-E: U.S. Army Medical Research Unit-Europe  
 USAMRU-K: U.S. Army Medical Research Unit-Kenya



## **USAARL**

### **U.S. Army Aeromedical Research Laboratory**

The U.S. Army Aeromedical Research Laboratory, Fort Rucker, Alabama, objectives are to prevent or minimize health hazards in the military operational environment, and to sustain aviator performance. Research areas include acoustics, vision, crew workload, stress and fatigue, repetitive impact, and life support systems. The USAARL participates in the development and source selection of Army aircraft systems, and is equipped with flight simulators to study effects of environmental extremes, medications, and stress on aviator performance.



## **USAISR**

### **U.S. Army Institute of Surgical Research**

The U.S. Army Institute of Surgical Research, Fort Sam Houston, Texas, is also known as the Army Burn Center. The USAISR is recognized worldwide for its advanced level of care for severely burned patients and for its research and extensive training program in the areas of burn research and trauma. The Institute conducts R&D on military trauma to include the treatment of burns, sepsis, and acute renal failure, as well as the cellular mechanisms and treatment of hemorrhagic shock. In addition, the USAISR trains flight teams in prompt aeromedical transfer and in-flight care for military and civilian patients with burn injuries.

## **USAMRICD**

### **U.S. Army Medical Research Institute of Chemical Defense**

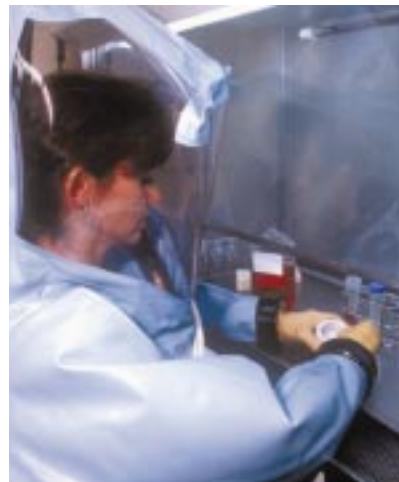
The U.S. Army Medical Research Institute of Chemical Defense, Aberdeen Proving Ground, Maryland, is charged with the development, testing, and evaluation of medical treatments and materiel to prevent and treat casualties of chemical warfare agents. Its mission includes fundamental and applied research in the pharmacology, physiology, toxicology, pathology, and biochemistry of chemical agents and their medical countermeasures. In addition to research, the Institute, in partnership with the USAMRIID, educates health care providers in the medical management of chemical and biological agent casualties.



## **USAMRIID**

### **U.S. Army Medical Research Institute of Infectious Diseases**

The U.S. Army Medical Research Institute of Infectious Diseases, Fort Detrick, Maryland, conducts research leading to the development of medical countermeasures against potential biological warfare threats and natural disease threats. A world scientific resource, the USAMRIID serves as a reference laboratory for the World Health Organization in Geneva and the Centers for Disease Control and Prevention in Atlanta, and collaborates with these agencies in the diagnosis and treatment of unusual diseases wherever they occur.







## ***USARIEM*** **U.S. Army Research Institute of Environmental Medicine**

The U.S. Army Research Institute of Environmental Medicine, Natick, Massachusetts, seeks to understand how soldiers react to military environmental and occupational stresses and to devise protective and therapeutic materiel and doctrinal solutions. Military environmental factors that are studied include environmental extremes, physical training, military work, nutrition, and occupational stresses of military training and operations. The Center for Environmental Health Research, Fort Detrick, Maryland, a detachment of the USARIEM, establishes mitigation standards and assessments, and interacts with the U.S. Army Corps of Engineers and other federal agencies involved in environmental mitigation R&D.



## ***WRAIR*** **Walter Reed Army Institute of Research**

The Walter Reed Army Institute of Research, Forest Glen, Maryland, is the oldest (1893), largest, and most diverse laboratory of the USAMRMC. Its mission is to counter threats from naturally occurring infectious diseases, high energy and trauma, and stress and performance. The new WRAIR/Naval Medical Research Center conforms with all regulatory standards for laboratory operations, animal welfare, human safety, and environmental protection; provides state-of-the-art research capabilities; and consolidates the majority of research operations within a single building. In addition, the WRAIR manages collocated research programs in laser/microwave bioeffects (U.S. Army Medical Research Detachment) and combat dentistry (U.S. Army Dental Research Detachment). The WRAIR also operates overseas research units in Thailand, Kenya, and Germany.

## ***USAHFPA*** **U.S. Army Health Facility Planning Agency**

The U.S. Army Health Facility Planning Agency, Falls Church, Virginia, is the USAMRMC's operational command that supports planning and execution of AMEDD facility life-cycle management worldwide. As the Army Medical Command's (MEDCOM's) deployable experts in planning, programming, design, construction, transition, and sustainment of facilities, the USAHFPA assists AMEDD and other customers in assessing and refining their facility requirements then executing design and construction investments whenever and wherever needed. The Agency also deploys its expertise globally as one of the MEDCOM's Special Medical Augmentation Response Teams-Health Support (SMART-HS) in support of operations other than war, peacekeeping, nation building, and disaster relief.



## ***USAMISSA*** **U.S. Army Medical Information Systems and Services Agency**

The role of the U.S. Army Medical Information Systems and Services Agency, Fort Detrick, Maryland, is to provide overall management of a cohesive and accountable AMEDD IM/IT acquisition and maintenance program for the sustainment of all Army medical information systems. The USAMISSA will develop and coordinate long-term IM/IT modernization, acquisition, and sustainment plans and programs for the Command to ensure access to the broadest capabilities possible.





## **USAMMA**

### **U.S. Army Medical Materiel Agency**

The U.S. Army Medical Materiel Agency, Fort Detrick, Maryland, serves as the Army Surgeon's General central focal point and executive agent for all strategic medical logistics. Its mission is to deliver and sustain responsive medical logistics support for all worldwide military health care operations. The USAMMA serves as the AMEDD's fielding command for all new medical materiel, and centrally manages a variety of strategic logistics programs such as war reserve and critical item asset management, deployment of materiel handoff teams, and operational oversight of medical materiel acquisition vehicles. Core skills and technologies center on conducting life-cycle management for commercial and nondevelopmental items, sustaining and modernizing the medical force, supporting exercises and contingency operations, and promoting medical logistics information and knowledge.



## **USAMMCE**

### **U.S. Army Medical Materiel Center–Europe**

The U.S. Army Medical Materiel Center–Europe, Pirmasens, Germany, supports the strategic role of the USAMMA by providing Joint medical logistics support within the European theater, and serves as a power projection platform for support of operations outside that theater. As the single integrated medical logistics manager for the military health care system, USAMMCE support focuses on acquisition, storage, and distribution of medical materiel; optical fabrication; and medical maintenance.

## **USAMMDA**

### **U.S. Army Medical Materiel Development Activity**

The U.S. Army Medical Materiel Development Activity, Fort Detrick, Maryland, develops and fields medical products for U.S. Armed Forces, in conjunction with the AMEDD C&S (the combat developer) and the USAMMA (the logistician). The USAMMDA plans, manages, and directs execution of medical materiel development to achieve U.S. Army and Joint Service materiel system objectives to meet cost, schedule, and performance. The USAMMDA's vision is to provide world-class medical solutions for U.S. warfighters.

## **USAMRAA**

### **U.S. Army Medical Research Acquisition Activity**

The U.S. Army Medical Research Acquisition Activity, Fort Detrick, Maryland, provides contracting support to the USAMRMC and its worldwide network of laboratories, to the Fort Detrick Army Garrison, military tenant activities, Army-wide projects sponsored by The Surgeon General, and congressionally mandated programs. The USAMRAA vision is to be a leader in innovation and the premier federal organization committed to acquisition excellence.





# **PROTECT, PROJECT, SUSTAIN...**

Medical research and materiel are critical to maintaining trained and ready Armed Services capable of rapid deployment and decisive victory. Future battlefields are expected to be at least as dangerous as any of the past, or any that were anticipated during the Cold War.

Our forces must be prepared to fight regional wars and win quickly in any climate or geographic region, against adversaries equipped with the most modern and powerful weapons. We must be able to adapt quickly and develop countermeasures to new threats to the soldier's health and performance.

No one knows precisely what threats we will face in the next conflict, but history suggests that victory will depend heavily on the presence of a superior medical technology base that can respond rapidly with required countermeasures to emerging health threats. The USAMRMC provides the expertise to meet the challenges of the future battlefield.

